

IAP9 Rec'd PCT/PTO 17 MAY 2006

64851-02.ST25

SEQUENCE LISTING

<110> The Government of the United States of America, as
represented by the Secretary of the Department of Health and
Human Services
Flomerfelt, Francis
Gress, Ronald

<120> SPATIAL FOR ALTERING CELL PROLIFERATION

<130> 4239-64851-02

<150> PCT/US2003/036874

<151> 2003-11-18

<160> 7

<170> PatentIn version 3.3

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<212> DNA

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<222> (84)..(677)

<223> Coding sequence

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Leu Phe Leu Gly Asn Val Tyr Lys Gly Ser
1 5 10

tta gca cct cgt agg gat gag gtg act agt cca aag gca gag ccc cag 161
Leu Ala Pro Arg Arg Asp Glu Val Thr Ser Pro Lys Ala Glu Pro Gln
15 20 25

cca gag acg aag ccg gag aac ctt cca agg agc cac ggg gat gtt ggg 209
Pro Glu Thr Lys Pro Glu Asn Leu Pro Arg Ser His Gly Asp Val Gly
30 35 40

ctc cag aaa gag act gtg gtc cca ggc att gtg gat ttc gag ctg atc 257
Leu Gln Lys Glu Thr Val Val Pro Gly Ile Val Asp Phe Glu Leu Ile
45 50 55

cat gag gag ctg aag acc aca aag ccc caa aca tca caa cca aca ccc 305
His Glu Glu Leu Lys Thr Thr Lys Pro Gln Thr Ser Gln Pro Thr Pro
60 65 70

agt gcc tac cgc ttt gga cgc cta agc cac cat tcc ttc ttc tcg agg 353
Ser Ala Tyr Arg Phe Gly Arg Leu Ser His His Ser Phe Phe Ser Arg
75 80 85 90

cac cac ccc caa cca cag cga gtg act cat atc caa gat atc gct ggg 401
His His Pro Gln Pro Gln Arg Val Thr His Ile Gln Asp Ile Ala Gly

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95

100

105

aag cct gtc tgc gtg gtc agg gac gag ttc tct ctg tcg gcc ttg act 449
 Lys Pro Val Cys Val Val Arg Asp Glu Phe Ser Leu Ser Ala Leu Thr
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cag ccc aca ttc tta tcc cgc tgt ctg atg ggg atg ccc acc atc tct 497
 Gln Pro Thr Phe Leu Ser Arg Cys Leu Met Gly Met Pro Thr Ile Ser
 125 130 135

gtc ccc att ggg gat cca cag tcc aat cgg aac ccc cag ctt tct act 545
 Val Pro Ile Gly Asp Pro Gln Ser Asn Arg Asn Pro Gln Leu Ser Thr
 140 145 150

tct gac acc tgg agg aag aaa ctg aag gac ctg gct tcc cga gtg act 593
 Ser Asp Thr Trp Arg Lys Lys Leu Lys Asp Leu Ala Ser Arg Val Thr
 155 160 165 170

gtc ttc act aag gaa atc cag cca aag ccc gat gag gtt ggt gtt gca 641
 Val Phe Thr Lys Glu Ile Gln Pro Lys Pro Asp Glu Val Gly Val Ala
 175 180 185

caa aga atg gag cct aga aaa aaa agg cct tct taa gtctcccaa 687
 Gln Arg Met Glu Pro Arg Lys Lys Arg Pro Ser
 190 195

tgctcagctg ctggcacggg aggggaagga ccctcataac ctcgaagggtg acagcgaaaa 747

tcaaagaaac acaaaatcac acctagcaga gaaatccaag aagggttccc agaaacacccc 807

tctaaagcaa ctgttcccaa cctgtctaata gccttgaccc ttgaatacag tttctcacac 867

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aaaaaa 933

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Asn Leu Pro Arg Ser His Gly Asp Val Gly Leu Gln Lys Glu Thr Val
 35 40 45

Val Pro Gly Ile Val Asp Phe Glu Leu Ile His Glu Glu Leu Lys Thr
 50 55 60

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Thr Lys Pro Gln Thr Ser Gln Pro Thr Pro Ser Ala Tyr Arg Phe Gly
65 70 75 80

Arg Leu Ser His His Ser Phe Phe Ser Arg His His Pro Gln Pro Gln
85 90 95

Arg Val Thr His Ile Gln Asp Ile Ala Gly Lys Pro Val Cys Val Val
100 105 110

Arg Asp Glu Phe Ser Leu Ser Ala Leu Thr Gln Pro Thr Phe Leu Ser
115 120 125

Arg Cys Leu Met Gly Met Pro Thr Ile Ser Val Pro Ile Gly Asp Pro
130 135 140

Gln Ser Asn Arg Asn Pro Gln Leu Ser Thr Ser Asp Thr Trp Arg Lys
145 150 155 160

Lys Leu Lys Asp Leu Ala Ser Arg Val Thr Val Phe Thr Lys Glu Ile
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Gln Pro Lys Pro Asp Glu Val Gly Val Ala Gln Arg Met Glu Pro Arg
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Lys Lys Arg Pro Ser
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Leu Phe Leu Gly Asn Val Tyr Lys Gly Ser
1 5 10
tta gca cct cgt agg gat gag gtg act agt cca aag gca gag ccc cag 161
Leu Ala Pro Arg Arg Asp Glu Val Thr Ser Pro Lys Ala Glu Pro Gln
15 20 25

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| cca gag acg aag ccg gag aac ctt cca agg agc cac ggg gat gtt ggg | 209 |
| Pro Glu Thr Lys Pro Glu Asn Leu Pro Arg Ser His Gly Asp Val Gly | |
| 30 35 40 | |
| ctc cag aaa gag act gtg gtc cca ggc att gtg gat ttc gag ctg atc | 257 |
| Leu Gln Lys Glu Thr Val Val Pro Gly Ile Val Asp Phe Glu Leu Ile | |
| 45 50 55 | |
| cat gag gag ctg aag acc aca aag ccc caa aca tca caa cca aca ccc | 305 |
| His Glu Glu Leu Lys Thr Thr Lys Pro Gln Thr Ser Gln Pro Thr Pro | |
| 60 65 70 | |
| agt gcc tac cgc ttt gga cgc cta agc cac cat tcc ttc ttc tcg agg | 353 |
| Ser Ala Tyr Arg Phe Gly Arg Leu Ser His His Ser Phe Phe Ser Arg | |
| 75 80 85 90 | |
| cac cac ccc caa cca cag cga gtg act cat atc caa gtt aca gga aga | 401 |
| His His Pro Gln Pro Gln Arg Val Thr His Ile Gln Val Thr Gly Arg | |
| 95 100 105 | |
| gag gac ctg gag cac tcc ctg ccc ctc acc acc tct ttc cag ctc ctt | 449 |
| Glu Asp Leu Glu His Ser Leu Pro Leu Thr Thr Ser Phe Gln Leu Leu | |
| 110 115 120 | |
| caa gct cct ggg gtc cag ccc atg gat ctc act ccc tct gca gat atc | 497 |
| Gln Ala Pro Gly Val Gln Pro Met Asp Leu Thr Pro Ser Ala Asp Ile | |
| 125 130 135 | |
| gct ggg aag cct gtc tgc gtg gtc agg gac gag ttc tct ctg tcg gcc | 545 |
| Ala Gly Lys Pro Val Cys Val Val Arg Asp Glu Phe Ser Leu Ser Ala | |
| 140 145 150 | |
| ttg act cag ccc aca ttc tta tcc cgc tgt ctg atg ggg atg ccc acc | 593 |
| Leu Thr Gln Pro Thr Phe Leu Ser Arg Cys Leu Met Gly Met Pro Thr | |
| 155 160 165 170 | |
| atc tct gtc ccc att ggg gat cca cag tcc aat cgg aac ccc cag ctt | 641 |
| Ile Ser Val Pro Ile Gly Asp Pro Gln Ser Asn Arg Asn Pro Gln Leu | |
| 175 180 185 | |
| tct act tct gac acc tgg agg aag aaa ctg aag gac ctg gct tcc cga | 689 |
| Ser Thr Ser Asp Thr Trp Arg Lys Lys Leu Lys Asp Leu Ala Ser Arg | |
| 190 195 200 | |
| gtg act gtc ttc act aag gaa atc cag cca aag ccc gat gag gtt ggt | 737 |
| Val Thr Val Phe Thr Lys Glu Ile Gln Pro Lys Pro Asp Glu Val Gly | |
| 205 210 215 | |
| gtt gca caa aga atg gag cct aga aaa aaa agg cct tct taa | 779 |
| Val Ala Gln Arg Met Glu Pro Arg Lys Lys Arg Pro Ser | |
| 220 225 230 | |
| gtctcccaa tgctcagctg ctggcacggg aggggaagga ccctcataac ctggaaggtg | 839 |
| acagcgaaaa tcaaagaaac acaaaatcac acctagcaga gaaatccaag aagggttccc | 899 |
| agaaacaccc tctaaagcaa ctgttcccaa cctgttctaata gccttgaccc ttgaatacag | 959 |
| tttctcacac tgcagtaacc cctgcccccg aaataaaatt attttcatta ctacttcaaa | 1019 |

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1035

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<212> PRT

<213> Mus musculus

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Glu Val Thr Ser Pro Lys Ala Glu Pro Gln Pro Glu Thr Lys Pro Glu
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Asn Leu Pro Arg Ser His Gly Asp Val Gly Leu Gln Lys Glu Thr Val
 35 40 45

Val Pro Gly Ile Val Asp Phe Glu Leu Ile His Glu Glu Leu Lys Thr
 50 55 60

Thr Lys Pro Gln Thr Ser Gln Pro Thr Pro Ser Ala Tyr Arg Phe Gly
 65 70 75 80

Arg Leu Ser His His Ser Phe Phe Ser Arg His His Pro Gln Pro Gln
 85 90 95

Arg Val Thr His Ile Gln Val Thr Gly Arg Glu Asp Leu Glu His Ser
 100 105 110

Leu Pro Leu Thr Thr Ser Phe Gln Leu Leu Gln Ala Pro Gly Val Gln
 115 120 125

Pro Met Asp Leu Thr Pro Ser Ala Asp Ile Ala Gly Lys Pro Val Cys
 130 135 140

Val Val Arg Asp Glu Phe Ser Leu Ser Ala Leu Thr Gln Pro Thr Phe
 145 150 155 160

Leu Ser Arg Cys Leu Met Gly Met Pro Thr Ile Ser Val Pro Ile Gly
 165 170 175

Asp Pro Gln Ser Asn Arg Asn Pro Gln Leu Ser Thr Ser Asp Thr Trp
 180 185 190

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Arg Lys Lys Leu Lys Asp Leu Ala Ser Arg Val Thr Val Phe Thr Lys
 195 200 205

Glu Ile Gln Pro Lys Pro Asp Glu Val Gly Val Ala Gln Arg Met Glu
 210 215 220

Pro Arg Lys Lys Arg Pro Ser
 225 230

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 Gly Cys Gly Asp Thr Gly Asp Trp Glu Gly Arg Trp Asn His Val Lys
 10 15 20

aag ttc ctc gag cgg tct gga ccc ttc aca cac ccc gat ttc gaa cca 150
 Lys Phe Leu Glu Arg Ser Gly Pro Phe Thr His Pro Asp Phe Glu Pro
 25 30 35

agc act gaa tca ctc cag ttc ttg tta gat aca tgt aaa gtt cta gtc 198
 Ser Thr Glu Ser Leu Gln Phe Leu Leu Asp Thr Cys Lys Val Leu Val
 40 45 50

att gga gct ggt ggc tta gga tgt gag ctt ctg aaa aat ctg gca tta 246
 Ile Gly Ala Gly Gly Leu Gly Cys Glu Leu Leu Lys Asn Leu Ala Leu
 55 60 65

tct ggt ttt aga cag att cat gtt ata gac atg gac act ata gat gtt 294
 Ser Gly Phe Arg Gln Ile His Val Ile Asp Met Asp Thr Ile Asp Val
 70 75 80 85

tcc aat tta aat aga cag ttt tta ttt agg cct aaa gat gty gga aga 342
 Ser Asn Leu Asn Arg Gln Phe Leu Phe Arg Pro Lys Asp Xaa Gly Arg
 90 95 100

ccc aag gct gaa gtt gct gca gaa ttc cta aat gac aga gtt cct aac 390
 Pro Lys Ala Glu Val Ala Ala Glu Phe Leu Asn Asp Arg Val Pro Asn
 105 110 115

tgc aac gtg gtm cca cat ttc aac aag atw caa gat ttt aac gac act 438
 Cys Asn Val Xaa Pro His Phe Asn Lys Xaa Gln Asp Phe Asn Asp Thr
 120 125 130

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| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| ttc | tac | cga | caa | ttt | cat | atc | att | gta | tgt | ggc | ctg | gac | tct | atc | ata | 486 |
| Phe | Tyr | Arg | Gln | Phe | His | Ile | Ile | Val | Cys | Gly | Leu | Asp | Ser | Ile | Ile | |
| 135 | | | | | | 140 | | | | | 145 | | | | | |
| gcg | aga | aga | tgg | atc | aat | gga | atg | ctg | ata | tct | ctt | cta | aat | tat | gaa | 534 |
| Ala | Arg | Arg | Trp | Ile | Asn | Gly | Met | Leu | Ile | Ser | Leu | Leu | Asn | Tyr | Glu | |
| 150 | | | | | 155 | | | | | 160 | | | | | 165 | |
| gat | ggt | gtg | ttg | gat | cca | agc | tcc | att | gta | cct | ttg | ata | gat | ggg | ggg | 582 |
| Asp | Gly | Val | Leu | Asp | Pro | Ser | Ser | Ile | Val | Pro | Leu | Ile | Asp | Gly | Gly | |
| | | | | 170 | | | | | 175 | | | | | 180 | | |
| aca | gaa | ggc | ttt | aaa | ggg | aat | gcc | cga | gtg | att | ttg | cct | gga | atg | acc | 630 |
| Thr | Glu | Gly | Phe | Lys | Gly | Asn | Ala | Arg | Val | Ile | Leu | Pro | Gly | Met | Thr | |
| | | | 185 | | | | | 190 | | | | | 195 | | | |
| gct | tgt | att | gag | tgc | act | ctg | gaa | ctt | tac | cca | cca | cag | gtc | aat | ttc | 678 |
| Ala | Cys | Ile | Glu | Cys | Thr | Leu | Glu | Leu | Tyr | Pro | Pro | Gln | Val | Asn | Phe | |
| | | 200 | | | | | 205 | | | | | 210 | | | | |
| ccc | atg | tgt | acc | att | gca | tct | atg | ccy | agg | ctc | cca | gaa | cac | tgt | atc | 726 |
| Pro | Met | Cys | Thr | Ile | Ala | Ser | Met | Xaa | Arg | Leu | Pro | Glu | His | Cys | Ile | |
| | 215 | | | | | 220 | | | | | 225 | | | | | |
| gag | tat | gtg | agg | atg | ttg | caa | tgg | cct | aaa | gag | cag | cct | ttt | gga | gat | 774 |
| Glu | Tyr | Val | Arg | Met | Leu | Gln | Trp | Pro | Lys | Glu | Gln | Pro | Phe | Gly | Asp | |
| 230 | | | | | 235 | | | | | 240 | | | | | 245 | |
| ggg | gtt | cca | tta | gat | gga | gat | gac | cct | gaa | cat | att | cag | tgg | att | ttc | 822 |
| Gly | Val | Pro | Leu | Asp | Gly | Asp | Asp | Pro | Glu | His | Ile | Gln | Trp | Ile | Phe | |
| | | | | 250 | | | | | 255 | | | | | 260 | | |
| caa | aag | tcc | ata | gag | aga | gca | tca | caa | tat | aat | att | aga | ggc | gtt | acc | 870 |
| Gln | Lys | Ser | Ile | Glu | Arg | Ala | Ser | Gln | Tyr | Asn | Ile | Arg | Gly | Val | Thr | |
| | | | 265 | | | | | 270 | | | | | 275 | | | |
| tac | aga | ctc | act | caa | ggg | gtg | gta | aaa | cga | atc | att | cct | gca | gta | gct | 918 |
| Tyr | Arg | Leu | Thr | Gln | Gly | Val | Val | Lys | Arg | Ile | Ile | Pro | Ala | Val | Ala | |
| | | | 280 | | | | 285 | | | | | 290 | | | | |
| tct | aca | aat | gca | gtc | att | gca | gct | gtg | tgt | gcc | act | gag | gtt | ttc | aag | 966 |
| Ser | Thr | Asn | Ala | Val | Ile | Ala | Ala | Val | Cys | Ala | Thr | Glu | Val | Phe | Lys | |
| | 295 | | | | | 300 | | | | | 305 | | | | | |
| ata | gct | aca | agt | gcg | tac | att | ccc | ctt | aat | aac | tac | ctg | gta | ttc | aat | 1014 |
| Ile | Ala | Thr | Ser | Ala | Tyr | Ile | Pro | Leu | Asn | Asn | Tyr | Leu | Val | Phe | Asn | |
| 310 | | | | | 315 | | | | | 320 | | | | | 325 | |
| gat | gta | gat | ggg | ctg | tac | act | tac | acg | ttt | gaa | gca | gag | aga | aag | gaa | 1062 |
| Asp | Val | Asp | Gly | Leu | Tyr | Thr | Tyr | Thr | Phe | Glu | Ala | Glu | Arg | Lys | Glu | |
| | | | | 330 | | | | | 335 | | | | | 340 | | |
| aac | tgt | cca | gca | tgt | agc | caa | ctt | cct | caa | aac | att | cag | ttt | tcc | cca | 1110 |
| Asn | Cys | Pro | Ala | Cys | Ser | Gln | Leu | Pro | Gln | Asn | Ile | Gln | Phe | Ser | Pro | |
| | | | 345 | | | | | 350 | | | | | 355 | | | |
| tca | gct | aaa | cta | cag | gag | gtc | tta | gac | tac | cta | acc | aac | agt | gct | tct | 1158 |
| Ser | Ala | Lys | Leu | Gln | Glu | Val | Leu | Asp | Tyr | Leu | Thr | Asn | Ser | Ala | Ser | |
| | | 360 | | | | | 365 | | | | | 370 | | | | |

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      375                      380                      385

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ccc  aat  ctt  tcc  aaa  aca  tta  aaa  gaa  ctg  gga  cta  gtt  gat  gga  caa      1302
Pro  Asn  Leu  Ser  Lys  Thr  Leu  Lys  Glu  Leu  Gly  Leu  Val  Asp  Gly  Gln
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Glu  Leu  Ala  Val  Ala  Asp  Val  Thr  Thr  Pro  Gln  Thr  Val  Leu  Phe  Lys
                        425                      430                      435

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Leu  His  Phe  Thr
                        440

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acagcctgac  atctagagta  tatcaaakat  aggcagtgtc  ttcattgcta  ctcataatat      1885

tgtgactatc  catgtgtgta  ttaattattg  cagaatttaa  cttgtccatg  ataatttgta      1945

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gcaatgccac  agagaccagt  atgcacaaat  ttaaaccaag  acatggctgt  tcaaagaaaa      2065

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<223> The 'Xaa' at location 121 stands for Val.

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<223> The 'Xaa' at location 222 stands for Pro.

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20 25 30

Pro Asp Phe Glu Pro Ser Thr Glu Ser Leu Gln Phe Leu Leu Asp Thr
35 40 45

Cys Lys Val Leu Val Ile Gly Ala Gly Gly Leu Gly Cys Glu Leu Leu
50 55 60

Lys Asn Leu Ala Leu Ser Gly Phe Arg Gln Ile His Val Ile Asp Met
65 70 75 80

Asp Thr Ile Asp Val Ser Asn Leu Asn Arg Gln Phe Leu Phe Arg Pro
85 90 95

Lys Asp Xaa Gly Arg Pro Lys Ala Glu Val Ala Ala Glu Phe Leu Asn
100 105 110

Asp Arg Val Pro Asn Cys Asn Val Xaa Pro His Phe Asn Lys Xaa Gln
115 120 125

Asp Phe Asn Asp Thr Phe Tyr Arg Gln Phe His Ile Ile Val Cys Gly
130 135 140

Leu Asp Ser Ile Ile Ala Arg Arg Trp Ile Asn Gly Met Leu Ile Ser
145 150 155 160

Leu Leu Asn Tyr Glu Asp Gly Val Leu Asp Pro Ser Ser Ile Val Pro
165 170 175

Leu Ile Asp Gly Gly Thr Glu Gly Phe Lys Gly Asn Ala Arg Val Ile

180

185

190

Leu Pro Gly Met Thr Ala Cys Ile Glu Cys Thr Leu Glu Leu Tyr Pro
 195 200 205

Pro Gln Val Asn Phe Pro Met Cys Thr Ile Ala Ser Met Xaa Arg Leu
 210 215 220

Pro Glu His Cys Ile Glu Tyr Val Arg Met Leu Gln Trp Pro Lys Glu
 225 230 235 240

Gln Pro Phe Gly Asp Gly Val Pro Leu Asp Gly Asp Asp Pro Glu His
 245 250 255

Ile Gln Trp Ile Phe Gln Lys Ser Ile Glu Arg Ala Ser Gln Tyr Asn
 260 265 270

Ile Arg Gly Val Thr Tyr Arg Leu Thr Gln Gly Val Val Lys Arg Ile
 275 280 285

Ile Pro Ala Val Ala Ser Thr Asn Ala Val Ile Ala Ala Val Cys Ala
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Thr Glu Val Phe Lys Ile Ala Thr Ser Ala Tyr Ile Pro Leu Asn Asn
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Tyr Leu Val Phe Asn Asp Val Asp Gly Leu Tyr Thr Tyr Thr Phe Glu
 325 330 335

Ala Glu Arg Lys Glu Asn Cys Pro Ala Cys Ser Gln Leu Pro Gln Asn
 340 345 350

Ile Gln Phe Ser Pro Ser Ala Lys Leu Gln Glu Val Leu Asp Tyr Leu
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Thr Asn Ser Ala Ser Leu Gln Met Lys Ser Pro Ala Ile Thr Ala Thr
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Leu Glu Gly Lys Asn Arg Thr Leu Tyr Leu Gln Ser Val Thr Ser Ile
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Glu Glu Arg Thr Arg Pro Asn Leu Ser Lys Thr Leu Lys Glu Leu Gly
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